WHAT IS CLAIMED IS:

1. A nucleic acid construct comprising:

(a) a first polynucleotide region encoding at least one first polypeptide capable of forming a functional ion channel or transporter when expressed within a cell; and

(b) a second polynucleotide region encoding at least one second polypeptide capable of forming a functional gap junction when expressed within said cell.

2. A cell, cell culture or tissue explant transformed with the nucleic acid construct of claim 1.

3. The cell, cell culture or tissue explant of claim 2, wherein the cell is selected from the group consisting of a fibroblast, a myoblast, an astroglial cell and an endothelial cell.

4. The cell, cell culture or tissue explant of claim 2, wherein the tissue explant is an organ tissue explant.

5. A pharmaceutical composition comprising, as an active ingredient, the nucleic acid construct of claim 1 and a pharmaceutically acceptable carrier.

6. The nucleic acid construct of claim 1, wherein said ion channel is selected from the group consisting of a sodium ion channel, a potassium ion channel, a calcium ion channel and a chloride ion channel.

7. The nucleic acid construct of claim 1, wherein said at least one first polypeptide is selected from the group consisting of a K channel polypeptide, a Na channel polypeptide, a Ca channel polypeptide, a Cl channel polypeptide, a Na/K transporter polypeptide, a Na/Ca transporter polypeptide, a Na/H transporter polypeptide and a Cl/HCO3 transporter polypeptide

8. The nucleic acid construct of claim 1, wherein said at least one second polypeptide is selected from the group consisting of connexin43, connexin45 and connexin26.

9. The nucleic acid construct of claim 1, further comprising at least one promoter being for directing the transcription of said first polynucleotide and said second polynucleotide.

10. The nucleic acid construct of claim 9, wherein said at least one promoter is functional in mammalian cells.

11. The nucleic acid construct of claim 9, wherein said at least one promoter is selected from the group consisting of a constitutive promoter, a tissue specific promoter, an inducible promoter and a developmentally regulated promoter.

12. The nucleic acid construct of claim 1, wherein said first polynucleotide region and said second polynucleotide region are transcriptionally fused via an IRES sequence.

13. The nucleic acid construct of claim 1, wherein said at least one first polypeptide and said at least one second polypeptide are translationally fused via at least one protease recognition site.

14. The nucleic acid construct of claim 9, wherein said at least one promoter includes two promoters, a first promoter for directing the transcription of said first polynucleotide and a second promoter for directing the transcription of said second polynucleotide.

15. A nucleic acid construct system comprising:

(a) a first nucleic acid construct including a first polynucleotide region encoding at least one first polypeptide capable of forming a functional ion channel or transporter when expressed within a cell; and

(b) a second nucleic acid construct including a second polynucleotide region encoding at least one second polypeptide capable of forming a functional gap junction when expressed within said cell.

16. A cell, cell culture or tissue explant transformed with the nucleic acid construct of claim 15.

17. A pharmaceutical composition comprising, as an active ingredient, the nucleic acid construct of claim 15 and a pharmaceutically acceptable carrier.

18. The nucleic acid construct system of claim 15, wherein said first nucleic acid construct further includes a first promoter being for directing the transcription of said first polynucleotide and further wherein

said second nucleic acid construct further includes a second promoter being for directing the transcription of said second polynucleotide.

19. The nucleic acid construct system of claim 18, wherein each of said first and said second promoters is functional in mammalian cells.

20. The nucleic acid construct system of claim 18, wherein each of first and said second promoters is independently selected from the group consisting of a constitutive promoter, a tissue specific promoter, an inducible promoter and a developmentally regulated promoter.

21. The nucleic acid construct system of claim 15, wherein said at least one first polypeptide is selected from the group consisting of a K channel polypeptide, a Na channel polypeptide, a Ca channel polypeptide, a Cl channel polypeptide, a Na/K transporter polypeptide, a Na/Ca transporter polypeptide, a Na/H transporter polypeptide and a Cl/ HCO3 transporter polypeptide.

22. The nucleic acid construct system of claim 15, wherein said at least one second polypeptide is selected from the group consisting of connexin43, connexin45 and connexin 26.

23. A method of modifying the electrophysiological function of an excitable tissue region of an individual, the method comprising the step of implanting cells into the excitable tissue region, each implanted cell being:

(a) capable of forming gap junctions with at least one cell of the excitable tissue region; and

(b) capable of forming a functional ion channel or transporter

said functional ion channel or transporter being capable of modifying the electrophysiological function of the excitable tissue region.

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24. The method of claim 23, wherein said ion channel is selected from the group consisting of a sodium ion channel, a potassium ion channel, a calcium ion channel and chloride ion channel.

25. The method of claim 23, wherein each implanted cell is transformed, prior to, or following implantation, with an exogenous polynucleotide expressing at least one polypeptide capable of forming said functional ion channel or transporter.

26. The method of claim 23, wherein each implanted cell is transformed, prior to, or following implantation, with an exogenous

polynucleotide expressing at least one polypeptide capable of forming said gap junctions.

27. The method of claim 25, wherein expression of said at least one polypeptide from said exogenous polynucleotide is regulatable by an endogenous or an exogenous factor.

28. The method of claim 23, wherein an ion permeability of said functional ion channel is regulatable by an endogenous or an exogenous factor.

29. The method of claim 23, further comprising the step of regulating permeability of said functional ion channel or an activity of said transporter to thereby regulate the electrophysiological function of the excitable tissue region.

30. The method of claim 28, wherein said step of regulating said permeability is effected by administering said exogenous factor to the excitable tissue region.

31. The method of claim 23, wherein each implanted cell is capable of forming said functional ion channel or transporter following induction.

32. The method of claim 23, wherein the excitable tissue region forms a part of an organ selected from the group consisting of a heart, a pancreas, a kidney, a brain and a liver.

33. The method of claim 23, wherein the method is utilized for regulating cardiac arrhythmia.

34. The method of claim 23, wherein the method is utilized for regulating secretion of endogenous factors from an organ including the excitable tissue region of the individual.

35. The method of claim 23, wherein the method is utilized for regulating neuronal discharge.

36. A method of modifying the electrophysiological function of an excitable tissue region of an individual, the method comprising the step of expressing an exogenous polypeptide in at least a portion of cells forming a part of, or being in contact with, the excitable tissue region, said

exogenous polypeptide being capable of forming a functional ion channel or transporter within said at least a portion of said cells to thereby modify the electrophysiological function of the excitable tissue region.

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37. The method of claim 36, further comprising the step of expressing a second exogenous polypeptide in said at least a portion of said cells, said second exogenous polypeptide being capable of forming functional pap junctions within said at least a portion of said cells.